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| 10/789,744      | 02/27/2004  | Wai Yuen Ho          | 200207272-1         | 8419             |

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| EXAMINER |
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LIANG, LEONARD S

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| ART UNIT | PAPER NUMBER |
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2853

| SHORTENED STATUTORY PERIOD OF RESPONSE | MAIL DATE  | DELIVERY MODE |
|--|------------|---------------|
| 3 MONTHS                               | 03/22/2007 | PAPER         |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

**Office Action Summary**

Application No.

10/789,744

Applicant(s)

HO, WAI YUEN

Examiner

Leonard S. Liang

Art Unit

2853

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 27 February 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 February 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

03/17/07  
LSL

**DETAILED ACTION*****Drawings***

The drawings are objected to because in paragraph 0021, line 3, clutch weights is labeled 216 instead of 216a. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either “Replacement Sheet” or “New Sheet” pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: 204. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be

Art Unit: 2853

labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-3 and 14 are rejected under 35 U.S.C. 102(b) as being anticipated by Minowa (US Pat 5183333).

Minowa discloses:

- {claim 1} A carriage drive system (figure 10A-B); a variable speed drive motor for propelling a movable carriage (figure 10A-B, reference 69); a mechanism for switching between a gear ratio resulting in a high carriage speed and a gear ration resulting in a low carriage speed wherein the mechanism for switching between the gear ration resulting in a high carriage speed and the gear ration resulting in a low carriage speed is actuated automatically (column 2, line 66 – column 3, line 3; column 5, lines 40-60)

Art Unit: 2853

- {claim 2} wherein the mechanism for switching between the gear ratios is a centrifugal clutch (figure 10A-B; switching action between two figures can be considered centrifugal clutch).
- {claim 3} wherein the gearing mechanism is a planetary gear assembly (figure 10A-B); a sun gear driven by the drive motor (figure 10A-B, reference 108); a ring gear (figure 10A-B, reference 113); a plurality of planet gears associated with a planet carrier (figure 10A-B, reference 109, 111)
- {claim 14} A method for printing; activating a variable speed drive motor to propel a movable carriage; switching between a gear ratio resulting in a high carriage speed and a gear ratio resulting in a low carriage speed; wherein switching between the gear ratio resulting in a high carriage speed and the gear ratio resulting in a low carriage speed occurs automatically by means actuated by the operational speed of the drive motor (figure 10A-B; column 2, line 66 – column 3, line 3; column 5, lines 40-60)

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ito et al (US Pat 5097189) in view of Lane (US Pat 1773535).

Art Unit: 2853

Ito et al discloses:

- {claim 1} A carriage drive system (figure 1); a variable speed drive motor for propelling a movable carriage (figure 1, reference 6)
- {claim 7} A printer (figure 1); a movable carriage supporting print heads having an ink ejecting nozzle (figure 1, reference 1-2); a slide rod for supporting and guiding the movable carriage (figure 1, reference '3B); a variable speed drive motor for propelling the movable carriage along the slide rod (figure 1, reference 6)
- {claim 14} A method for printing (figure 1); activating a variable speed drive motor to propel a movable carriage (figure 1, reference 6)

Ito et al differs from the claimed invention in that it does not disclose:

- {claim 1} a mechanism for switching between a gear ratio resulting in a high carriage speed and a gear ratio resulting in a low carriage speed wherein the mechanism for switching between the gear ratio resulting in a high carriage speed and the gear ratio resulting in a low carriage speed is actuated automatically
- {claims 2 and 8} wherein the mechanism for switching between the gear ratios is a centrifugal clutch
- {claims 3 and 9} wherein the gearing mechanism is a planetary gear assembly having: a sun gear driven by the drive motor; a ring gear; and a plurality of planet gears associated with a planet carrier
- {claims 4 and 10} wherein operation of the drive motor at a high speed causes the mechanism for switching between gear ratios to engage the ring gear causing

Art Unit: 2853

the planet gears and the drive gear to be locked together such that they rotate as one with the sun gear resulting in a 1:1 gear ratio and operation of the drive motor at a low speed causes the mechanism for switching between gear ratios to disengage the ring gear causing the sun gear to turn the planet gears which turn the ring gear resulting in a gear ratio greater than 1:1

- {claims 5 and 11} further comprising a speed calibration member for adjusting the gear ratio between the drive motor and the ring gear
- {claims 6 and 12} wherein the gear ratio between the drive motor and the ring gear is proportional to a friction force between the planet carrier and the speed calibration member
- {claims 7} a gearing mechanism having a gear ratio resulting in a high carriage speed and a gear ratio resulting in a low carriage speed; and a mechanism for switching between the gear ratios wherein the mechanism for switching between the gear ratios is actuated automatically
- {claim 13} wherein the speed calibration member is manually adjustable
- {claim 14} switching between a gear ratio resulting in a high carriage speed and a gear ratio resulting in a low carriage speed; wherein switching between the gear ratio resulting in a high carriage speed and the gear ratio resulting in a low carriage speed occurs automatically by means actuated by the operational speed of the drive motor

Lane discloses:

- {claim 1} a mechanism for switching between a gear ratio resulting in a high carriage speed and a gear ratio resulting in a low carriage speed wherein the mechanism for switching between the gear ratio resulting in a high carriage speed and the gear ratio resulting in a low carriage speed is actuated automatically (figure 4; column 1, lines 2-5; column 1, lines 25-33; columns 9-10; note that although Lane is directed to motor vehicles, Lane discloses, "I wish it to be understood, however, that the invention is not necessarily limited to this particular use as it may well find expression in a speed changing mechanism for other power transmissions, wherein it is desirable to effect an automatically variable driving ratio between a driving element and an element to be driven." (column 1, lines 25-33))
- {claims 2 and 8} wherein the mechanism for switching between the gear ratios is a centrifugal clutch (column 2, line 67; column 4, lines 10-16)
- {claims 3 and 9} wherein the gearing mechanism is a planetary gear assembly having: a sun gear driven by the drive motor; a ring gear; and a plurality of planet gears associated with a planet carrier (figure 4, reference 13, 27, 28)
- {claims 4 and 10} wherein operation of the drive motor at a high speed causes the mechanism for switching between gear ratios to engage the ring gear causing the planet gears and the drive gear to be locked together such that they rotate as one with the sun gear resulting in a 1:1 gear ratio and operation of the drive motor at a low speed causes the mechanism for switching between gear ratios to disengage the ring gear causing the sun gear to turn the planet gears which turn



Art Unit: 2853

the ring gear resulting in a gear ratio greater than 1:1 (column 9, lines 52-57; column 10, lines 78-84)

- {claims 5 and 11} further comprising a speed calibration member for adjusting the gear ratio between the drive motor and the ring gear (column 9, lines 52-57; column 10, lines 78-84)
- {claims 6 and 12} wherein the gear ratio between the drive motor and the ring gear is proportional to a friction force between the planet carrier and the speed calibration member (column 9, line 52 – column 10, line 101)
- {claims 7} a gearing mechanism having a gear ratio resulting in a high carriage speed and a gear ratio resulting in a low carriage speed; and a mechanism for switching between the gear ratios wherein the mechanism for switching between the gear ratios is actuated automatically (figure 4; column 1, lines 2-5; column 1, lines 25-33; column 9-10)
- {claim 13} wherein the speed calibration member is manually adjustable (column 2, lines 65-67; column 9, line 52 – column 10, line 101)
- {claim 14} switching between a gear ratio resulting in a high carriage speed and a gear ratio resulting in a low carriage speed; wherein switching between the gear ratio resulting in a high carriage speed and the gear ratio resulting in a low carriage speed occurs automatically by means actuated by the operational speed of the drive motor (figure 4; column 1, lines 2-5; column 1, lines 25-33; column 9-10)

It would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the teachings of Lane into the invention of Ito et al. The motivation for the skilled artisan in doing so is to gain the benefit of providing an improved change speed mechanism for connecting driving and driven elements in automatically variable driving ratios.

### *Conclusion*

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Burnett (US Pat 2197536) discloses a transmission mechanism.

Kawamura (US Pat 5841450) discloses an ink jet print recording apparatus.

Yamane (US Pat 5926192) discloses a print control system.

Nagoshi et al (US Pat 5359355) discloses an ink jet recording apparatus for recording with variable scanning speeds.

Kimura et al (US Pat 5402161) discloses a serial recording apparatus.

Elgee (US Pat 5411340) discloses a "milepost" single-channel encoder, scale, and method, for midscan turn around in a scanning-head printer or reader.

Jacobs et al (US Pat 5563591) discloses a programmable encoder using an addressable display.

Tsuji et al (US Pat 5668581) discloses an ink jet printing apparatus.

Art Unit: 2853

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Leonard S. Liang whose telephone number is (571) 272-2148. The examiner can normally be reached on 8:30-5 Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Meier can be reached on (571) 272-2149. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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**STEPHEN MEIER**  
**SUPERVISORY PATENT EXAMINER**